The analysis of the Chinese wax itself corresponds with the formula $C_{108}H_{108}O_4$, which admits of a simple explanation of the nature of its decompositions: its decomposition by potash being explained by the equation

$$C_{108}H_{108}O_4 + KO\,HO = (C_{54}H_{53}O_3 + KO) + C_{54}H_{56}O_2,$$

and its decomposition by heat by the equation

$$C_{108}H_{108}O_4 = C_{54}H_{54}O_4 + C_{54}H_{54},$$

the substance itself belonging to the class of compound ethers.

The author announces his intention of following up this paper by a third on the constitution of myricine.

May 18, 1848.

The MARQUIS OF NORTHAMPTON, President, in the Chair.

"On a new case of the Interference of Light." By the Rev. Baden Powell, M.A., F.R.S. &c., Savilian Professor of Geometry in the University of Oxford.

The principal experiment exhibiting the newly-observed case of interference described by the author, is the following: into a hollow prism or trough containing oil of sassafras, anise, cassia, &c., a plate of glass is dipped so as to intercept the light passing through the upper or thicker half of the prism, and leave the lower half clear: the spectrum of a line of light or narrow slit, is then immediately seen to be covered with dark bands parallel to the slit or edge of the prism.

Some substances, as oil of turpentine, water, &c., give no bands with this arrangement, but will give them, if a complementary arrangement be adopted, viz. by placing a narrow slip of glass at the bottom of the prism, or so as to intercept the light passing through the thinner half.

The production of the bands in general, and the reason of the difference existing in the cases referred to, are fully accounted for on the theory of waves and interference: whence the following formula is deduced, giving the number of bands (n), when μ_p and μ_m, the indices for any ray for the plate and for the medium, are known, of which λ is the wave length; and taking these quantities for any two rays (1) and (2) of the spectrum, τ being the thickness of the plate, we have the number of bands between them expressed by

$$n = \left\{ \left(\frac{\mu_p - \mu_m}{\lambda} \right)_1 - \left(\frac{\mu_p - \mu_m}{\lambda} \right)_2 \right\} \tau.$$

The numbers thus calculated agree with observation for many media. The distinction of the two cases alluded to depends on whether n result positive or negative; that is, on the relative values of the indices; also agreeing with observation.

If doubly refracting media are used as plates, two sets of bands are seen superimposed, which are easily shown to be due to the ordinary and extraordinary rays respectively. But for some of these crystals the data are as yet insufficient to give more than a general accordance with theory.

The method might be applied practically for determining the indices of many substances to which the ordinary method is inapplicable from the impossibility of forming them into prisms: n will also exhibit palpably the most insensible degree of double refraction, and may thus become useful to the mineralogist.

There is a close analogy between these phenomena and those observed by Baron von Wrede, and by Sir D. Brewster and Mr. Fox Talbot, of which Mr. Airy has given a theory. A similar theory is necessary for explaining some of the more minute details of the present phenomena; and on this subject some extensive researches have been pursued by Mr. Stokes of Pembroke College, Cambridge, which will soon appear.

"On the Meteorology of the Lake District of Cumberland and Westmoreland." By John Fletcher Miller, Esq. Communicated by Lieut.-Col. Sabine, R.A., For. Sec. R.S.

The author has devoted nearly four years to the investigation of the quantities of rain falling in the lake districts of Cumberland and Westmoreland; and he commenced, two years ago, a set of experiments specially directed to ascertain the amount of rain deposited at great elevations above the sea, such as the summits of our highest English mountains. As the investigation proceeded, some remarkable results were obtained, which coming to the knowledge of the Royal Society early in last year (1847), the Council contributed a sum of money from the Donation Fund towards the current expenses attending this inquiry, of which the results are given in the present communication, comprising extensive tables of observations relative to the quantity of rain in different situations within the above period of time.

May 25, 1848.

The MARQUIS OF NORTHAMPTON, President, in the Chair.

"On the structure of the Jaws and Teeth of the Iguanodon." By Gideon Algernon Mantell, Esq., LL.D., F.R.S., Vice-President of the Geological Society, &c.

The recent discovery of the right dentary bone of the lower jaw of an adult Iguanodon with teeth, having enabled the author, with the aid afforded by other specimens, to determine the structure of the maxillary organs of that gigantic herbivorous reptile, the result of his investigations are embodied in the present communication.

The first memoir of the author on the teeth of the Iguanodon was published in the Philosophical Transactions for 1825; but owing